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10/584,262	06/26/2006	Toshihiro Iwakuma	292935US0PCT	5686
22850 7590 07/22/2009 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER WILSON, MICHAEL H				
ART UNIT 1794		PAPER NUMBER		
NOTIFICATION DATE 07/22/2009		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/584,262

Applicant(s)

IWAKUMA ET AL.

Examiner

MICHAEL WILSON

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/86)
Paper No(s)/Mail Date 20060926; 20090506
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Claim Objections

1. Claim 4 is objected to because of the following informalities:

Regarding claim 4, "independently" in line 2 should be deleted. The limitation "independently" refers to has only a single option leaving the word meaningless in the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, Ar₁ to Ar₄ are defined as a benzene residue however near the end of claim one the claim recites "when at least one of Ar₁ to Ar₄ represents m-phenylene or o-phenylene, or when all of Ar₁ to Ar₄ each represent p-phenylene in the general formula (1), at least one of R₁ to R₈ represents a substituted or unsubstituted aromatic hydrocarbon group..." This is confusing because that there does not appear to be other options where the quoted limitation is not present. Ar₁ to Ar₄ is phenylene by definition and there are only three possible substitution patterns for the disubstituted

phenyl. If one phenylene is not para-substituted then that one must either be ortho- or meta- substituted. Claims 2-11 are indefinite by dependence.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 3-8, 10, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Hosokawa et al. (US 2002/0048687 A1).

Regarding claims 1 and 3-5, Hosokawa et al. disclose a material comprising a compound of instant formula (1) (page 8, compounds E14-E16) wherein Cz is a carbazole (page 8, compound E14) or a compound of instant formula (2a) wherein A is ethylene or ethenylene (page 8, compounds E15 and E16). Ar₁ and Ar₄ are meta-substituted phenylenes with phenyl substituents in instant R1 and R7. Ar₂ and Ar₃ are para-substituted phenylenes wherein instant R₃-R₆ for unsaturated condensed rings with Ar.

Statements in the preamble reciting the purpose or intended use of the claimed invention which do not result in a structural difference between the claimed invention and the prior art do not limit the claim and do not distinguish over the prior art apparatus. See, e.g., *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963); *In re Sinex*, 309 F.2d 488, 492, 135 USPQ 302, 305 (CCPA 1962). If a prior art

structure is capable of performing the intended use as recited in the preamble, then it meets the claim. See, e.g., *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997) and cases cited therein, as it has been held that the recitation of a new intended use for an old product does not make a claim to that old product patentable. *In re Schreiber*, 44 USPQ2d 1429 (Fed. Cir. 1997). See also MPEP § 2111.02 and § 2112 - § 2112.02.

Regarding claim 6-8, 10, and 11, Hosokawa et al. disclose all the claim limitations as set forth above. Additionally the reference discloses wherein the material is a host material for an organic electroluminescent device ([0056] and [0087]). The device comprises an organic layer sandwiched between a cathode and an anode [0054]. The organic layer comprises a light-emitting layer with the material as host [0087] and an electron injection layer between the light-emitting layer and the cathode [0054]. The electron injection layer comprises Alq, a compound with a nitrogen atom, and a reductive dopant such as LiF doped into the layer, which is in the interfacial region between the cathode and the light-emitting layer or thin film layer ([0063]-[0064] and [0142]-[0144]).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1, 2, and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taguchi (JP-2002/30887 A) machine translation relied upon.

Regarding claims 1 and 2, Taguchi discloses a material comprising a compound of instant formula (1) ([0027 compounds HT-15 and HT16) wherein Cz is a compound of instant formula (2a) wherein A is an ethenylene. Ar₁ and Ar₄ are para-substituted phenylenes. Ar₂ and Ar₃ are ortho-substituted phenylenes. The reference also discloses that the compound may be substituted ([0011]-[0013]) and specifically demonstrates phenyl substituents ([0025] and [0026], compounds HT-11 and HT-13). The reference does not explicitly disclose a compound of instant formula (1) with a phenyl substituent.

However while reference does not explicitly disclose a compound of instant formula (1) with a phenyl substituent, such a substitution would be obvious to one of ordinary skill in the art at the time of the invention. One of ordinary skill in the art would reasonably expect an aryl or phenyl substituent to be suitable in the compounds of Taguchi because Taguchi teaches the compounds may be substituted and gives examples where a phenyl substituent is used. One of ordinary skill would also

reasonably expect such a compound to have similar properties and be suitable for the same purpose given that Taguchi teaches that the basis of the compounds hole transporting ability, a key property, is derived from the instant Cz (X or carbazole derivative in the reference[0007] and [0010]) instead of in the substituents.

Further while Taguchi does not exemplify formula (1) with a phenyl substituent, this does not negate a finding of obviousness under 35 USC 103 since a preferred embodiment such as an example is not controlling. Rather, all disclosures "including unpreferred embodiments" must be considered. *In re Lamberti* 192 USPQ 278, 280 (CCPA 1976) citing *In re Mills* 176 USPQ 196 (CCPA 1972). Therefore, it would have been obvious to one of ordinary skill in the art to utilize a compound of formula (1) with a phenyl substituent given that Taguchi teaches each one.

Regarding claim 5, modified Taguchi discloses all the claim limitations as set forth above. Additionally the reference teaches that instant Cz (X) is preferably a carbazole [0010]. While Taguchi does not exemplify formula (1) with carbazole as instant Cz (X), this does not negate a finding of obviousness under 35 USC 103 since a preferred embodiment such as an example is not controlling. Rather, all disclosures "including unpreferred embodiments" must be considered. *In re Lamberti* 192 USPQ 278, 280 (CCPA 1976) citing *In re Mills* 176 USPQ 196 (CCPA 1972). Therefore, it would have been obvious to one of ordinary skill in the art to utilize a compound of formula (1) with carbazole as instant Cz given that Taguchi teaches each one.

Regarding claims 6-9, modified Taguchi discloses all the claim limitations as set forth above. Additionally the reference teaches an organic electroluminescent device

comprising an organic layer sandwiched between a cathode and an anode [0046]. The organic layer comprises a light emitting layer with a compound of instant formula (1) as the host with a phosphorescent dopant [0054].

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hosokawa et al. (US 2002/0048687 A1) as applied to claim 8 in view of Baldo et al. (Very high-efficiency green organic light-emitting devices based on electrophosphorescence.).

Regarding claim 9, Hosokawa et al. disclose all the claim limitations as set forth above. The reference also discloses the light-emitting layer may be doped with a light-emitting material including green emitting materials [0087]. However the reference does not explicitly disclose a phosphorescent compound as a dopant in the light-emitting layer.

Baldo et al. teach another organic light-emitting device (abstract). The reference teaches that a phosphorescent compound (Ir(ppy)_3) can be doped into the light-emitting layer giving high efficiencies and high luminance (abstract).

It would be obvious to one of ordinary skill in the art at the time of the invention to combine the phosphorescent compound of Baldo et al. with the light-emitting layer of Hosokawa et al. One of ordinary skill in the art would reasonably expect such a combination to be suitable given that Baldo et al teach the phosphorescent complex as a suitable dopant for the light-emitting layer of an organic electroluminescent device with a similar host material (CBP) and that Hosokawa et al. teach the light-emitting layer

may be doped with other green luminescent materials. One of ordinary skill in the art would be motivated by the desire to have high luminance and efficiencies.

10. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taguchi (JP-2002/30887 A) as applied to claim 7 above, and further in view of Hosokawa et al. (US 2002/0048687 A1).

Regarding claims 10 and 11, modified Hosokawa et al. discloses all the claim limitations as set forth above. Additionally the reference discloses wherein the electron injection layer between the light-emitting layer and the cathode [0039]. However the reference does not explicitly disclose a nitrogen-atom containing compound forming an essential part of the electron injection layer or a reductive dopant in the interfacial region between the organic thin layer and the cathode.

Hosokawa et al. teaches a similar organic electroluminescent device (abstract). The reference teaches an electron injection layer between the light-emitting layer and the cathode [0054]. The electron injection layer comprises Alq, a compound with a nitrogen atom, and a reductive dopant such as LiF doped into the layer, which is in the interfacial region between the cathode and the light-emitting layer or thin film layer ([0063]-[0064] and [0142]-[0144]). The reference teaches this layer improves the driving stability of the device.

It would be obvious to one of ordinary skill in the art at the time of the invention to combine the electron injection layer of Hosokawa et al. with the device of Taguchi. One of ordinary skill in the art would reasonably expect such a combination to be suitable

given that Hosokawa et al. teach the layer as suitable for an organic electroluminescent device and Taguchi teaches an electron injection layer as suitable. One of ordinary skill in the art would be motivated by a desire to improve the driving stability of the device.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL WILSON whose telephone number is (571) 270-3882. The examiner can normally be reached on Monday-Thursday, 7:30-5:00PM EST, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

